



PH-161100010610

Seat No. _____

B. B. A. (Sem. VI) (CBCS) (WEF 2016) Examination

March/April - 2020

Statistics

(Advanced Operations Research Techniques)

(New Course)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) Attempt all questions.
(2) Each question carries equal marks.

- 1 (a) Differentiate between PERT and CPM. 7
(b) Explain : 7
(i) Total float
(ii) Free Float
(iii) Independent Float

OR

- 1 Draw PERT network diagram for the data given below : 14

Activity	Immediate Preceding Activity	Activity Time (works)		
		Optimistic Time (t_o)	Most Likely Time (t_m)	Pessimistic Time (t_p)
A	-	4	7	13
B	A	6	9	11
C	A	5	7	9
D	B	3	5	7
E	C	7	8	10
F	D	2	3	5
G	E	6	7	8
H	F, G	2	3	4

- (i) Compute the expected time for each activity.
(ii) Give the critical path.
(iii) Find the expected duration of the project.
(iv) Compute Standard Deviation for critical path.

- 2 (a) What do you mean by replacement policy ? Describe important replacement policies. 7
- (b) Discuss about the factors to be considered for replacement decisions. 7

OR

- 2 The cost of machine is Rs. 12,000 and its scrap value is Rs. 500. Maintenance cost is found from experience which is as shown in the table below : 14

Year	1	2	3	4	5	6	7	8
Maintenance cost (Rs.)	200	500	800	1200	1800	2500	3200	4000

When the machine should be replaced ?

- 3 (a) What do you mean by sequencing problem ? Give the assumptions of sequencing problem. 7
- (b) Explain briefly the algorithm for processing on jobs through two machines. 7

OR

- 3 5 jobs are processed through 3 machines X, Y and Z in that order. The time taken to process the jobs are given in the table below. 14

Job	Processing Time in Hours		
	Machines		
	X	Y	Z
J ₁	9	6	5
J ₂	10	7	10
J ₃	7	4	8
J ₄	8	3	7
J ₅	12	5	6

- (i) Find the optimal sequence.
- (ii) Find the total elapsed time.
- (iii) Find idle time on all three machines.
- (iv) Find total idle time.

- 4 (a) Which are different types of inventories ? Explain. 7
 (b) Write the benefits of inventory management. 7

OR

- 4 A company supplies needles to hospitals and like to 14
 reduce its inventory cost by determining optimal number of
 needles to be purchased from the manufacturer. The annual
 demand is 10,000 units. The ordering cost per order is Rs.
 100 and holding cost is Rs. 0.50 per unit per year.
 (i) Calculate the optimal order size.
 (ii) Assuming 250 days per year find the number of orders
 and expected time between orders.
 (iii) Calculate total inventory cost per year.

- 5 Explain the following terms : 14
 (i) Pure Strategy
 (ii) Mixed Strategy
 (iii) Saddle Point
 (iv) Dominance Rule.

OR

- 5 Solve the following game and determine the best optimal 14
 strategies for both the players and also find the value of the
 game.

		Player B			
		B ₁	B ₂	B ₃	B ₄
Player A	A ₁	35	65	25	5
	A ₂	30	20	15	0
	A ₃	40	50	0	10
	A ₄	55	60	10	15